

# Demonstrating the Economic Value of Co-ordinated Cancer Services

## An examination of resource utilisation in Manchester

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Date: March 2010

### 1. Key points

- Using real patient data across the Manchester health economy, Macmillan worked with the Monitor Group and the NHS in Manchester to track the interventions, resource use and associated costs of lung and breast cancer patients diagnosed through the two week wait over a five year period.
- This highlighted that patients with similar disease profiles were not always receiving similar care and so some had higher associated costs. We believe that poor coordination of care is contributing to this.
- On analysis, the data also suggested that changes could be made to pathways of care to improve services for all patients. This includes reducing avoidable emergency admissions, reducing length of hospital stay and increasing the number of patients able to die at home.
- We suggest that
  - improving coordination so that a small percentage of patients are moved to a less resource intensive cancer journey
  - improving the above key aspects of care for breast and lung cancer patients in Manchestercould release savings of the region of 10% of the measured NHS costs for these patients.
- A further £170,000 could be released annually to the wider economy through saved benefit payments and increases in tax contributions, if half of this sample of lung and breast cancer patients who currently return to work and then leave were more effectively supported through vocational rehabilitation.
- Macmillan believes this exercise reveals the value that services providing information and support deliver in terms of ensuring patients receive appropriate and high quality care. We further believe this would apply equally to all cancer types as well as other locations across the UK.
- We hope that this research will now be replicated elsewhere and will prove useful to commissioners looking to drive up quality while improving efficiencies within the healthcare system.

### 2. Macmillan Cancer Support

There are currently two million people living with or beyond cancer in the UK. On the basis of current trends, this will have risen to four million by 2030. Macmillan and our partners are striving to improve the care given

to patients at all points on their cancer journey. With the Department of Health in England, we co-chair the National Cancer Survivorship Initiative which is trialing new models of care for cancer survivors. There is no doubt that patients find high quality specialist services helpful both during and after treatment. In the current financial climate, with resources tightening, it will become ever more vital that high quality services also demonstrate that they are efficient and productive.

Macmillan believes that improving quality and productivity are mutually reinforcing. Well targeted investment and improvements over the past years have already improved quality and released NHS resources. We hope that this study demonstrates further potential for quality and productivity improvements.

### **3. Background**

Macmillan has worked with the Monitor Group (a strategy consulting company) and various partners in Manchester (NHS Manchester, North Manchester General Hospital as part of Pennine Acute Hospitals NHS Trust, Central Manchester and Manchester Children's University Hospitals NHS Trust, Christie Hospital Foundation NHS Trust, Manchester City Council, University Hospitals of South Manchester Foundation NHS Trust and St Ann's Hospice) to observe where costs were incurred as individual patients were supported at each point of their cancer journey, anywhere in the NHS.

The purpose of the study was to test our hypothesis that high quality, coordinated care results in lower costs to the NHS. Our intention was to use the results of this study to support commissioning decisions.

### **4. Analysing the cancer journey in Manchester**

This exercise began with the examination of the health and social care economy in Manchester. Accessing real data from real patients we were able to track patients along their cancer journey and determine their use of NHS resources and the associated costs. We examined data from all the Manchester hospitals, St Ann's Hospice and Manchester City Council. This included hospital activity data, Macmillan internal data, data from the Public Health Mortality File, and Hospice data. This data was then compared to the NICE clinical guidelines for breast and lung and other national benchmarks and studies.

We selected lung and breast cancer patients, representing two high incidence cancer types with differing survival rates, diagnosed from 2004 to 2008 via the two week wait system (approximately half of all patients). An analysis of the data showed how patient care is actually delivered and suggested that patients were receiving a wide variation in care and that some were therefore experiencing additional, potentially avoidable interventions.

A pattern of three journey types for both breast and lung cancer was analytically derived, based on cost. The three different cancer journey types were characterised using five key factors: the total cost of care, number of events, duration under care, location of that care and a disease severity 'proxy' (a combination of survival rate and age at diagnosis). The following tables highlight the key differences in resource utilisation between the differing cancer journeys identified. However, it should be noted that the costs given are likely to represent a minimum spend as not all data along the pathway was included such as community palliative health care and routine pharmacotherapy data.

**Table One  
Breast cancer**

	<b><u>Cancer journey 1- low cost</u></b> <i>Patients tended to have a less severe prognosis with a relatively brief, less complex cancer journey</i>	<b><u>Cancer journey 2 – medium cost</u></b> <i>Patients tended to have a similarly less severe prognosis, but with a more complex cancer journey</i>	<b><u>Cancer journey 3 – high cost</u></b> <i>More complex, more resource intensive pathways</i>
<b>% of patients</b>	<b>14%</b>	<b>35%</b>	<b>51%</b>
<b>% of total cost</b>	<b>6%</b>	<b>28%</b>	<b>66%</b>
<b>Average cost of journey</b>	<b>£4,228</b>	<b>£8,251</b>	<b>£13,500</b>
<b>Average days in inpatient setting*</b>	<b>1.2 days</b>	<b>6.0 days</b>	<b>16.3 days</b>
<b>Average length of inpatient spell**</b>	<b>4.3 days</b>	<b>4.6 days</b>	<b>8.1 days</b>
<b>Average unplanned inpatient visits (per/patient)</b>	<b>0</b>	<b>0.1</b>	<b>0.5</b>
<b>Average # events in outpatient setting</b>	<b>2.8 events</b>	<b>21.0 events</b>	<b>27.0 events</b>
<b>Average # events in A&amp;E setting</b>	<b>0.3 events</b>	<b>0.3 events</b>	<b>1.2 events</b>
<b>Patient Severity Proxy***</b>	<b>High: 0%</b> <b>Med-Low: 100%</b>	<b>High: 0%</b> <b>Med-Low: 100%</b>	<b>High: 47%</b> <b>Med-Low: 53%</b>
<b>5-year Mortality</b>	<b>0%</b>	<b>0%</b>	<b>39%</b>

\* Total number of days in an inpatient setting / number of patients; \*\*Length of inpatient spell / number of spells; \*\*\* The severity rating is a proxy and it is based on patients' age at time of diagnosis, mortality & place of death; It does not reflect the patients tumor staging at diagnosis

**Table Two  
Lung Cancer**

	<b><u>Cancer journey 1 – low cost</u></b> <i>Patients tended to have a more severe prognosis with a relatively brief, less complex cancer journey</i>	<b><u>Cancer journey 2 – medium cost</u></b> <i>Patients tended to have a less severe prognosis, but a more complex cancer journey</i>	<b><u>Cancer journey 3 – high cost</u></b> <i>More complex, more resource intensive pathways</i>
<b>% of patients</b>	<b>34%</b>	<b>30%</b>	<b>37%</b>
<b>% of total cost</b>	<b>14%</b>	<b>31%</b>	<b>55%</b>
<b>Average cost of journey</b>	<b>£12,269</b>	<b>£18,645</b>	<b>£27,088</b>
<b>Average days in inpatient setting *</b>	<b>11.3 days</b>	<b>19.4 days</b>	<b>22.9 days</b>
<b>Average length of inpatient spell**</b>	<b>13.7 days</b>	<b>5.9 days</b>	<b>2.6 days</b>
<b>Average unplanned inpatient visits</b>	<b>0.5</b>	<b>1.2</b>	<b>1.6</b>
<b>Average # events in outpatient setting</b>	<b>0.6 events</b>	<b>5.7 events</b>	<b>17.0 events</b>
<b>Average # events in A&amp;E setting</b>	<b>0.3 events</b>	<b>0.5 events</b>	<b>0.4 events</b>
<b>Patient Severity Proxy***</b>	<b>High: 73%</b> <b>Med-Low: 27%</b>	<b>High: 59%</b> <b>Med-Low: 41%</b>	<b>High: 52%</b> <b>Med-Low: 48%</b>
<b>5-year Mortality</b>	<b>96%</b>	<b>91%</b>	<b>94%</b>

\* Total number of days in an inpatient setting / number of patients; \*\*Length of inpatient spell / number of spells; \*\*\* The severity rating is a proxy and it is based on patients' age at time of diagnosis, mortality & place of death; It does not reflect the patients tumor staging at diagnosis

### ***a. Coordination of care***

On closer inspection of these cancer journeys, it was apparent that within cancer journey three there was a group of patients with a similar disease profile to that of journey two (less complex, less resource intensive). Additional costs were due to factors such as unplanned admissions and increased length of inpatient stays.

The project team examined the causes of these factors with clinical staff working in Manchester who believed that breakdowns in communication, coordination and the provision of information for some patients as the underlying cause of a proportion of these additional costs. These conclusions were then validated with the Project Steering Group which included clinicians and commissioners from the NHS in Manchester.

Using these findings, Macmillan and the clinical teams in Manchester are now planning how to improve issues around communication, coordination and information. The team hopes to address more complex issues such as

- a lack of specialist support within primary care to prevent acute admissions,
- the lack of emergency oncology teams within A and E who can manage emergency patients and prevent hospital admissions,
- a review of existing follow-up arrangements.

There is agreement from healthcare staff and the Project Steering Group that tackling these elements could improve patient care, while simultaneously ensuring that patients with a less severe prognosis do not generate unnecessary costs (eg would experience cancer journey two as opposed to three).

### ***b. Reducing the cost of specific aspects of care***

In discussions on where potentially avoidable interventions could lie, and hence care could be made more efficient, we identified the following possible areas:

- Patients receiving inappropriate follow up in secondary care (breast)
- The number of patients dying at home rather than in hospital (breast and lung)
- Patients experiencing long lengths of stay in hospital (breast)
- High admissions to hospital (breast and lung)

This applied to patients in the two higher cost cancer journey types (ie cancer journey two and three). The project team examined the potential for applying the national benchmarks within these areas of care in Manchester. In discussions with those working in Manchester, the extent to which these could be realistically and conservatively applied was determined and again validated by the Project Steering Group as indicated in Table Three.

**TABLE THREE**

Benchmark	Source	How It could Be Applied	Influence on Journey Type 2		Influence on Journey Type 3	
			Before	After	Before	After
<b>Breast 1:</b> Decrease in the number of unplanned admissions to hospital by 11% (from 1.59 to 1.41 per 6 months)	Evaluation of the Gold Standards Framework, Macmillan Phase 3–6, National Audit Study: Final Report, March 2007	<i>Isolate unplanned events and decrease them by -11%</i>	0.5 unplanned event days	0.4 unplanned event days	3.4 unplanned event days	3.0 unplanned event days
<b>Breast 2:</b> Decrease the length of stay for breast cancer surgery from 6.6 days to 23 hours	Bridging the gap, case studies . . . Demonstrating what and how to deliver tomorrow's agenda for the NHS, NHS 2009	<i>Manchester length of breast cancer surgery already lower than benchmark — so decrease by -37%</i>	3.8 days	2.3 days	5.5 days	3.3 days
<b>Breast 3:</b> Decrease the frequency of outpatient follow-up per patient by: 1st year after treatment: 3–4/yr 2 <sup>nd</sup> –3rd year: 2/yr 4th year: 1/yr An average decrease in frequency of follow up by 1.3 events	Interview with clinicians, July 2009	<i>Decrease by 1.3 events for both journey types 2 and 3</i>	8.3 events	7.0 events	8.8 events	7.5 events

<b>Breast 4:</b> Decrease the percentage of patients who die at hospitals from ~60% to 29.5%	DOH Operating Framework 2007/08: PCT Baseline Review of Services for End of Life Care, Manchester PCT	<i>Number of patients dying in hospital reduced to 29.5% — assuming the events instead occur in primary care</i>	0%	0%	62% of patient deaths occurring in hospital	29.5% of patient deaths occurring in hospital
<b>Lung 1:</b> Decrease in the number of unplanned admissions to hospital by 11% (from 1.59 to 1.41 per 6 months)	Evaluation of the Gold Standards Framework, Macmillan Phase 3–6, National Audit Study: Final Report, March 2007	<i>Isolate unplanned events and decrease them by -11%</i>	1.2 unplanned event days	1.07 unplanned event days	1.6 unplanned event days	1.42 unplanned event days
<b>Lung 2:</b> Decrease the percentage of patients who die in hospitals from ~60% to 30%	DOH Operating Framework 2007/08: PCT Baseline Review of Services for End of Life Care, Manchester PCT	<i>Number of patients dying in hospital reduced to 29.5% — assuming the events instead occur in primary care</i>	67% of patient deaths occurring in hospital	30% of patient deaths occurring in hospital	56% of patient deaths occurring in hospital	30% of patient deaths occurring in hospital
<b>Lung 3:</b> Decrease in the number of GP consultations by 13%	Adapted from Guide for commissioners Cancer Care, 2008	<i>Number of events for follow up in primary care decreased by 13%</i>	6.7 events	5.8 events	4.3 events	3.7 events

All data resources except Breast 4 and Lung 2 are UK level; assumptions were reviewed by clinicians in Manchester to ensure local relevance.

### ***c. Supporting people with cancer to return to work***

Finally, the project team examined the potential of supporting more cancer patients into employment. Many people with cancer wish to return to work after treatment but many struggle to do so due to a lack of information and support from health services and their employers.

Studies show that 11% of the people who returned to work subsequently left due to cancer related issues. Many have underestimated the ongoing impact of their condition, such as fatigue, and have returned to work too quickly after completing treatment, or without suitable support. Those out of work due to long-term ill health or disability place a financial burden on the wider economy in terms of increased benefit payments and reduced tax contributions.

Returning to work has been shown to offer patients wellbeing benefits as well as improving their financial situation. The National Cancer Survivorship Initiative is piloting vocational rehabilitation support for people with cancer and developing specific services which will help more people to return to and stay in work. Macmillan is also supporting employers and trade unions with best practice guidance.

The project team examined the number of people with cancer claiming benefits within Manchester and other ways in which these patients were being supported financially, for example through transportation costs.

## **5. Conclusions**

Using the data obtained from Manchester, a model was developed to consider:

1. The potential economic value of improving care coordination so that a proportion of the patients who travel through journey three could be moved to journey two.
2. The potential value of improving care within specific elements of the journey such as decreasing the length of stay in hospital caused by coordination rather than clinical reason.
3. The potential value of supporting more cancer patients to return to and stay in work.

### ***a. Shifting patient journeys***

The difference in costs between journeys two and three is significant. For example, breast cancer patients on journey three spent an average of 16 days as in-patients. Their peers on journey two spent only six days as in-patients, while those on journey one just one day.

Of breast cancer patients, 51% experience care that is characterised as journey three. However, approximately half of these have a similar disease profile to patients in journey two. The analysis showed that improving co-ordination of care could result in some patients on journey three, where there is an average of 16 days in the inpatient setting, moving to a journey where there is an average of six days.



Similarly for lung cancer, round 37% of patients travel through journey three. Again, approximately half of these have a similar profile to patients in journey two.

Using what the Project Steering Group thought were conservative assumptions, the data showed that investment to improve communication, coordination and information, and steps to address some of the specific specialist support gaps outlined above, could lead to a number of these patients (21% of breast cancer patients and 13% of lung cancer patients) being moved to the more streamlined pathway. We estimate that in the region of £260,000 could be released annually in Manchester.

***b. Improving aspects of care***

If investment to improve the specific elements of care indicated in table three above led to reduced health and social care resource utilisation (including for example reduced length of stay after treatment, reduced outpatient follow-up, reduced hospital deaths and reduced GP consultations), we estimate that in the region of £220,000 could be released annually in Manchester.

Together, the money released through both shifting patient journeys and improving aspects of care amounts to around 10% of the measured NHS cost for these patients.

***c. Supporting patients to return to work***

If through investment in improved vocational support and rehabilitation, half of those who return to and then leave work as a result of their cancer (5% of the patient population) were supported to remain in work; this would lead to direct savings to the public purse. These savings would be decreased benefits paid to patients, an increase in income tax paid by patients, and a decrease in transport subsidies to patients. In Manchester, we estimate that this would release £170,000 annually into the wider economy. In terms of social benefits alone, this represents a £61 decrease paid out per week for breast cancer patients and a £48 decrease per week for lung cancer patients.

**6. Discussion and next steps**

Investing in improving key aspects of care such as coordination, communication and information as well as new services to support people immediately post-treatment, has the potential to deliver improved productivity, as well as improving the quality of care for the patient.

In Manchester we have identified specific areas for potential service improvements within the care of breast and lung cancer patients identified through the two week wait. We believe this would dramatically improve patient care and experience while releasing an estimated £650,000 per year to the health, social care and wider economy.

This represents only half of patients with two particular types of cancer within one area of the country. The potential benefits to patients and the associated value to the health and wider economy are therefore much greater. While this analysis is based on Manchester data, we believe this work is applicable to the wider health care system. We believe it provides a powerful tool to help prioritise and focus service development and to assess where and how interventions in the care pathway could have the most impact economically as well as for patient benefit.

Macmillan hopes to continue to work with its partners within health and social care to realise these financial as well as patient benefits through our range of services.

### **Thanks**

The joint project team from Macmillan, the Monitor Group and the NHS in Manchester would like to thank their many colleagues who provided the time, access and expertise to make this study possible.